Claims

[c1] 1. A gradient coil assembly for a magnetic resonance imaging system comprising:
an first gradient coil configured to generate a first gradient field in a first field of view;
a second gradient coil configured to generate a second gradient field orthogonal to said first gradient field in a second field of view; and
a third gradient coil configured to generate a third gradient field orthogonal to said first gradient field and said second gradient field in a plurality of fields of view.

[c2] 2. The gradient coil assembly of Claim 1 wherein said first gradient coil, said second gradient coil and said third gradient coil comprise an Z-axis, a X-axis and a Y-axis gradient coils respectively.

[c3] 3. The gradient coil assembly of Claim 1 wherein at least one of said first gradient coil and said second gradient coil comprise only a single gradient coil.

[c4] 4. The gradient coil assembly of Claim 1 wherein said plurality of fields of view comprises a wide field of view and a zoom field of view.

[c5] 5. A gradient coil assembly for a magnetic resonance imaging system comprising
an first gradient coil configured to generate a first gradient field in a single field of view;
a second gradient coil configured to generate a second gradient field orthogonal to said first gradient field in at least one field of view; and
a third gradient coil configured to generate a third gradient field orthogonal to said first gradient field and said second gradient field in a plurality of fields of view; and
wherein at least one of said first gradient coil and said second gradient coil comprise only a single coil and said third gradient coil comprises a plurality coils configured to generate said plurality of fields of view.

[c6] 6. The gradient coil assembly of Claim 5 wherein said first gradient coil, said

second gradient coil and said third gradient coil comprise an Z-axis, a X-axis and a Y-axis gradient coils respectively.

[c7] 7. The gradient coil assembly of Claim 5 wherein said plurality of fields of view comprises a wide field of view and a zoom field of view.

[c8] 8. A method for decreasing gradient field pulse sequence duration for a magnetic resonance imaging system, the method comprising:
establishing an allowable gradient field strength for an axis of a plurality of axes for a field of view;
applying a weighting factor associated with each said axis of said plurality of axes;
establishing a slew rate responsive to a selected axis of said plurality of axes that exhibits a largest gradient field strength in light of said weighting factor and said field of view; and
operating said plurality of axes at said largest gradient field strength.

Sub. A cont.

[c9] 9. The method of Claim 8 wherein said establishing is responsive to an effective gradient coil length.

[c10] 10. The method of Claim 8 wherein said weighting factor is one of a plurality of weighting factors corresponding to comparative allowable gradient field strengths among said plurality of axes.

[c11] 11. The method of Claim 8 wherein said plurality of axes correspond to an X, Y, and Z axes of said magnetic resonance imaging system.

[c12] 12. The method of Claim 8 wherein said operating includes limiting a gradient field strength of only said selected axis of said plurality of axes.

[c13] 13. A method for reducing peripheral nerve stimulation for a magnetic resonance imaging system, the method comprising:
establishing an allowable gradient field strength for an axis of a plurality of axes for a field of view;
applying a weighting factor associated with each said axis of said plurality of axes;

establishing a slew rate responsive to a selected axis of said plurality of axes that exhibits a largest gradient field strength in light of said weighting factor and said field of view; and
operating said plurality of axes at said largest gradient field strength.

[c14] 14. The method of Claim 13 wherein said establishing is responsive to an effective gradient coil length.

Sub fai cont.

[c15] 15. The method of Claim 13 wherein said weighting factor is one of a plurality of weighting factors corresponding to comparative allowable gradient field strengths among said plurality of axes.

[c16] 16. The method of Claim 13 wherein said plurality of axes correspond to an X, Y, and Z axes of said magnetic resonance imaging system.

[c17] 17. The method of Claim 13 wherein said operating includes limiting a gradient field strength of only said selected axis of said plurality of axes.

[c18] 18. A system for decreasing gradient field pulse sequence duration in a magnetic resonance imaging system, comprising:
a magnetic resonance imaging system including a gradient coil assembly for a magnetic resonance imaging system comprising:
an first gradient coil configured to generate a first gradient field in a first field of view;
a second gradient coil configured to generate a second gradient field orthogonal to said first gradient field in a second field of view; and
a third gradient coil configured to generate a third gradient field orthogonal to said first gradient field and said second gradient field in a plurality of fields of view.

[c19] 19. The system of Claim 18 wherein said first gradient coil, said second gradient coil and said third gradient coil comprise an Z-axis, a X-axis and a Y-axis gradient coils respectively.

[c20] 20. The system of Claim 18 wherein at least one of said first gradient coil and said second gradient coil comprise only a single gradient coil.

[c21] 21. The system of Claim 18 wherein said plurality of fields of view comprises a wide field of view and a zoom field of view.

[c22] 22. A system for reducing peripheral nerve stimulation in a magnetic resonance imaging system, comprising:

a magnetic resonance imaging system including a gradient coil assembly for a magnetic resonance imaging system comprising:

an first gradient coil configured to generate a first gradient field in a first field of view;

a second gradient coil configured to generate a second gradient field orthogonal to said first gradient field in a second field of view; and

a third gradient coil configured to generate a third gradient field orthogonal to said first gradient field and said second gradient field in a plurality of fields of view.

Sub a' cont.

[c23] 23. A storage medium encoded with a machine-readable computer program code;

said code including instructions for causing a computer to implement a method for reducing peripheral nerve stimulation for a magnetic resonance imaging system, the method comprising:

establishing an allowable gradient field strength for an axis of a plurality of axes for a field of view;

applying a weighting factor associated with each said axis of said plurality of axes;

establishing a slew rate responsive to a selected axis of said plurality of axes that exhibits a largest gradient field strength in light of said weighting factor and said field of view; and

operating said plurality of axes at said largest gradient field strength.

[c24]

24. A computer data signal comprising code configured to cause a processor to implement a method for reducing peripheral nerve stimulation in a magnetic resonance imaging system, the method comprising:

establishing an allowable gradient field strength for an axis of a plurality of axes for a field of view;

applying a weighting factor associated with each said axis of said plurality of axes;

establishing a slew rate responsive to a selected axis of said plurality of axes that exhibits a largest gradient field strength in light of said weighting factor and said field of view; and

operating said plurality of axes at said largest gradient field strength.

[c25] 25. A system for decreasing gradient field pulse sequence duration and reducing peripheral nerve stimulation with known gradient pulse areas for a magnetic resonance imaging system, the method comprising:

a means for establishing an allowable gradient field strength for an axis of a plurality of axes for a field of view;

a means for applying a weighting factor associated with each said axis of said plurality of axes;

a means for establishing a slew rate responsive to a selected axis of said plurality of axes that exhibits a largest gradient field strength in light of said weighting factor and said field of view; and

a means for operating said plurality of axes at said largest gradient field strength.